

US009510888B2

(12) United States Patent Lalonde

(54) CRYOGENIC BALLOON DEVICE WITH ELECTROPORATION TREATMENT REGION

(71) Applicant: Medtronic CryoCath LP, Toronto

(CA)

(72) Inventor: Jean-Pierre Lalonde, Candiac (CA)

(73) Assignee: Medtronic CryoCath LP, Toronto,

Ontario (CA)

(*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

U.S.C. 154(b) by 0 days.

This patent is subject to a terminal dis-

claimer.

(21) Appl. No.: 14/932,565

(22) Filed: Nov. 4, 2015

(65) Prior Publication Data

US 2016/0051309 A1 Feb. 25, 2016

Related U.S. Application Data

- (63) Continuation of application No. 13/282,811, filed on Oct. 27, 2011, now Pat. No. 9.204,916.
- (51) Int. Cl.

 A61B 18/02 (2006.01)

 A61B 18/14 (2006.01)

 A61B 18/00 (2006.01)
- (52) U.S. Cl.

(Continued)

(10) Patent No.: US 9,510,888 B2

(45) **Date of Patent:**

*Dec. 6, 2016

(58) Field of Classification Search

(56) References Cited

U.S. PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS

CA 2588367 A1 6/2006 WO 2008142686 A2 11/2008

OTHER PUBLICATIONS

International Search Report and Written Opinion dated Feb. 6, 2013, for corresponding International Application No. PCT/CA2012/000966; International Filing Date: Oct. 19, 2012, 2012 consisting of 7 pages.

(Continued)

Primary Examiner — Edward Moran

Assistant Examiner — Michael Carey
(74) Attorney, Agent, or Firm — Christopher & Weisberg,
PA

(57) ABSTRACT

An intravascular ablation device, including a flexible elongate body; an expandable element positioned on the elongate body; a radiofrequency or electroporation treatment segment located distally of the expandable element; a cryogenic coolant source in fluid communication with an interior of the expandable element; and a radiofrequency or electroporation energy source in communication with the radiofrequency or electroporation treatment segment.

20 Claims, 3 Drawing Sheets

